

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

BMR3174 – SUPPLY CHAIN MANAGEMENT

(All sections / Groups)

3 MARCH 2017

9.00 a.m - 11.00 a.m

(2 Hours)

INSTRUCTIONS TO STUDENTS:

1. This Question paper consists of 7 pages only.
2. **Section A:** Answer all **THREE (3)** questions.
Section B: Answer any **ONE (1)** of **TWO (2)** questions.
3. The distribution of the marks for each question is given at the end of each question.
4. Please write all your answers in the Answer Booklet provided.

SECTION A:**INSTRUCTION: ANSWER ALL THREE (3) QUESTIONS (75 MARKS)****QUESTION 1**

Consider the following information of Fine Shoes Sdn Bhd (FSSB) that shoes from three plants (plant A, B and C) to three stores in Location X, Y and Z. The table below summaries the plant capacity, store demand and delivery cost per unit.

Fine Shoes Sdn Bhd (FSSB)'s Plant Capacity, Demand
and Delivery Cost Per Unit from Plant to Store

From (Plant)	To			CAPACITY
	Store X (RM)	Store Y (RM)	Store Z (RM)	
A	2.00	2.00	3.50	400
B	4.00	5.00	4.50	500
C	3.00	3.00	3.00	100
DEMAND	200	250	300	

- Identify the shipping cost for FSSB using the Initial Solution Method.
(5 marks)
 - Use Northwest Method to identify the transportation cost. Which method better, Northwest or Initial? Justify
(5 marks)
 - Based on the output from b) Northwest Method, identify any possible improvement via Stepping-stone method and find the lowest delivery cost. Students are required to show all the improvement steps leading to optimization.
(15 marks)
- [Total: 25 marks]

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QUESTION 2

Management has designed an output rate of 275 units per day. Assume 440 minutes are available per day. For the set of task given below, do the following:

Task	Time (minutes)	Precedes Task
A	0.3	-
B	0.6	-
C	0.4	A
D	1.2	B
E	0.2	C
F	0.6	D
G	0.1	E
H	0.5	G, F
I	0.3	H

In order to retain competitiveness in business, calculate the following

- Draw the precedence diagram. (3 marks)
- Compute the appropriate cycle time. (2 marks)
- Compute the theoretical minimum number of workstations required. (2 marks)
- Balance the line by using the longest work element decision rule based on the answer obtained at (c). (2 marks)
- Determine the efficiency? (2 marks)
- Currently the company has two workstations only. Balance the line based on two work stations' cycle time and the longest work element decision rule. What is the efficiency? (6 marks)
- If the company wants to produce 325 units of outputs, how many workstations will be needed? Balance the line using the longest work element decision rule, and then, calculate its efficiency. (8 marks)

[Total: 25 marks]

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QUESTION 3

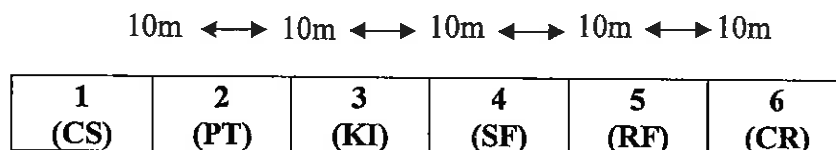
Mr Mazni, the FOB's manager has a new operation room under consideration for student's registration and application related matters. You have been asked to evaluate the operation layout based on the information given. There are 6 workstations and the number of trips as below:

Number of trips between workstations

To From	Counter Service (CS)	Photostat (PT)	Key in online (KI)	Storing Forms (SF)	Retrieving Forms (RF)	Consultation Room (CR)
CS	-					
PT	23	-				
KI	24	52	-			
SF	13	5	17	-		
RF	21	56	28	25	-	
CR	60	15	57	3	42	-

Propose the best alternative by calculating the following

- a) Total weighted-distance score (meters) if Mr Mazni assigned the following workstations into the layout area as **Figure XYZ** (for instance, counter service (CS) into layout area of 1 etc). The areas that share a side are approximately 10 meters apart.

**Figure XYZ**

(10 marks)

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- b) Total weighted-distance score (meters) if Mr Mazni compressed the 6 workstations (CS, PT, KI, SF, RF and CR) into the 5 available areas as **Figure ABC**. These areas are labelled in alphabetic order (A, B, C, D, E).

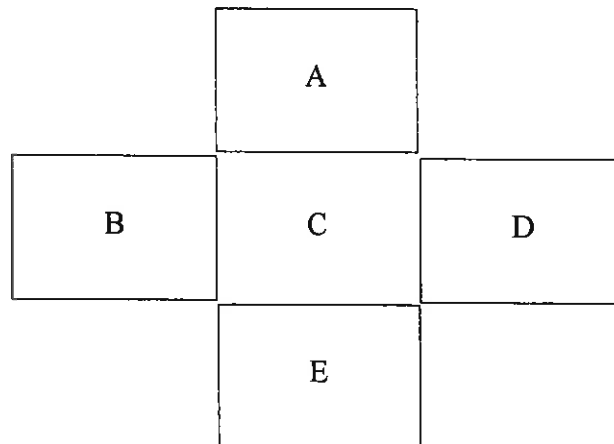


Figure ABC

Distance Between the Figure ABC's Layout Areas (meters)

	A	B	C	D	E
A	0				
B	15	0			
C	10	10	0		
D	15	20	10	0	
E	20	15	10	15	0

Important Notes:

- 1) The new layout must be able to reduce the total movement by at least 40% from the layout of the question 3 a).
- 2) Students are required to adhere to **Figure ABC** and to assign all the six workstations into any five of the available layout areas (Assuming Mr Mazni is willing to reset all the work stations). **As there are 6 workstations and only 5 areas for them to occupy. It will be important to know that two workstations will share a single space area.**
- 3) Based on **Figure ABC**, calculate the new total weighted-distance (meters) that comprises all the 6 workstations.
- 4) Label clearly all the workstations on Figure ABC.

(15 marks)

[Total: 25 marks]

Continued...

SECTION B:**INSTRUCTION: ANSWER ANY ONE (1) QUESTION (25 MARKS)****QUESTION 4**

A project has the following activities, times and precedence relationships

Activity	Time (Days)	Preceding Activities
A	10	None
B	9	A
C	20	A
D	6	A
E	5	B, D
F	7	B, C
G	3	D, E
H	2	F

Solve the problems by applying the following

a) Draw a precedence diagram for the project.

(2 marks)

b) Compute the earliest start times, earliest finish times, latest start times, latest finish times and slack times. Write these values in the precedence diagram

(10 marks)

c) Determine the critical path.

(2 marks)

d) How long is this project estimated to take?

(1 marks)

e) Suppose that the following additional information (**Table QWE**) is available for the project. How much would it cost to shorten the project by 5 days? Which activities would you shorten and what is the new project cost?

(10 marks)

Table QWE: Summary of Crash Time and Crash Cost

Activity	Normal Time (days)	Normal cost (RM)	Crash Time (days)	Crash Cost (RM)
A	10	50	8	150
B	9	40	7	200
C	20	70	19	160
D	6	20	5	50
E	5	30	3	30
F	7	80	4	290
G	3	50	2	180
H	2	60	1	180

[Total: 25 marks]

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QUESTION 5

The table shows MU company's aggregate demand for upcoming 6 months to capture the extremes in demand during the busiest and slowest months. Currently the MU company is engaging **50 workers** and each worker works **10 regular hours** a day to produce folding bicycles. The build out time (produce and assemble time) on a complete bicycle is **5 labour hours**. The total production of the bicycles is limited by the number of working days.

Forecast Aggregate Demand

Month	Jan	Feb	March	April	May	June
Demand (units)	1800	1500	2100	1900	1100	1600
Number of working days	22	19	21	21	22	20

Operating Cost

Material Cost	RM 100 per unit
Beginning inventory	400 units
Stockout cost	RM 5.00 per unit per month
Inventory holding cost	RM 1.50 per unit per month
Hiring workers	RM 200 per worker
Firing workers	RM 250 per worker
Subcontracting cost	RM 120 per unit (inclusive of material cost)
Labour Cost	
Regular time - First 8 Hours	RM 4.00 per hour
Overtime	RM 6.00 per hour (Overtime is limited to the maximum 20% of regular time. No change in production rate per unit regardless of regular time nor overtime)

Continued...

Solve MU's problem by applying the following production plan:

- a) Plan A — Chase strategy. Stockout and Subcontracting options are not permitted.

(12 marks)

- b) Plan B — Level strategy, calling for a one-time adjustment of the workforce before month Jan begins. **The warehouse now constraints the maximum allowable inventory per month to 1000 units or less.** Stockout and Subcontracting options are not permitted.

(13 marks)

[Total: 25 marks]

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